

## Case 3267

***Cherax tenuimanus* Smith, 1912 (Crustacea, Decapoda, PARASTACIDAE): proposed conservation of usage of the specific name**

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**Abstract.** The purpose of this application, under Article 75.6 of the Code, is to conserve the specific name *Cherax tenuimanus* Smith, 1912 in its accustomed usage, for a species of freshwater crayfish or 'marron', important in the aquaculture industry, particularly in Australia. It has long been recognised that there are two subspecies of *C. tenuimanus*; in 2002 Austin elevated these to species level and proposed the name *Cherax cainii* for one. Based on the supposed location of Smith's (1912) type series of *C. tenuimanus*, Austin applied the name *C. tenuimanus* to geographically isolated marron found only in a small catchment in Western Australia, and applied his new name *C. cainii* to all other marron in Australia and elsewhere. This switching of names is causing confusion since almost all usage of the name *C. tenuimanus* refers to marron occurring outside the area of Smith's type series. It is proposed that all previous type fixations for the names *Cherax tenuimanus* Smith, 1912 and *Cherax cainii* Austin in Austin & Ryan, 2002 be set aside and neotypes designated for both species to maintain the accustomed usage of the name *Cherax tenuimanus*.

**Keywords.** Nomenclature; taxonomy; Crustacea; Decapoda; PARASTACIDAE; *Cherax*; *Cherax tenuimanus*; *Cherax cainii*; freshwater crayfish; marron; aquaculture; Australia.

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1. Smith (1912, p. 166) established the name *Cherax tenuimanus* for a species of freshwater crayfish, commonly known as marron, originally distributed in the rivers and dams of the south-west of Western Australia. He spelled the generic name *Cherax* as *Chaeraps*, but this is an incorrect subsequent spelling by Huxley (1878) of *Cherax* Erichson, 1846. *Cherax tenuimanus* Smith provides significant local recreational fishing, as well as an aquaculture industry in Western Australia, in other states of Australia and worldwide.

2. The name *Cherax tenuimanus* Smith, 1912 has been in common usage since 1912, with approximately 200 publications by at least 90 authors internationally. The papers include taxonomic studies (e.g. Smith, 1912, p. 166; McCulloch, 1914, p. 233; Clark, 1936, p. 20; Riek, 1967, p. 112), genetic studies (e.g. Austin & Knott, 1996;

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2. The name *Cherax tenuimanus* Smith, 1912 has been in common usage since 1912, with approximately 200 publications by at least 90 authors internationally. The papers include taxonomic studies (e.g. Smith, 1912, p. 166; McCulloch, 1914, p. 233; Clark, 1936, p. 20; Riek, 1967, p. 112), genetic studies (e.g. Austin & Knott, 1996;

Imgrund et al., 1997; Nguyen et al., 2002), biological and ecological studies (e.g. Shipway, 1951; Morrissy, 1978; Huner, 1994; Holdich, 2002), recreational fishing (e.g. Morrissy & Caputi, 1981; Molony & Bird, 2002; Molony et al., 2002), aquaculture (e.g. Shireman, 1973; Morrissy et al., 1990; Lawrence & Morrissy, 2000; Lawrence & Jones, 2002) and translocation studies (e.g. Avenant-Oldewage, 1993; Holdich et al., 1999; Henttonen & Huner, 1999; Zeilder, 2000; Nguyen et al., 2002). Thus the specific name *Cherax tenuimanus* Smith has been used extensively to describe all marron since 1912, including several revisions of the genus *Cherax* (e.g. Smith, 1912; McCulloch, 1914; Clark, 1936; Riek, 1967; Austin, 1996; Austin & Knott, 1996; Imgrund et al., 1997; Nguyen et al., 2002).

3. Papers by Austin (1986) and Horwitz (1990, 1995) indicated that there were two subspecies of *C. tenuimanus*. In a review by Austin & Ryan (2002) of the allozyme evidence for *C. tenuimanus*, Austin (2002, p. 360) elevated these subspecies to species level and proposed the name *Cherax cainii* for one. Austin & Ryan (2002, p. 363) reported that *C. cainii* originally had a restricted distribution in the south-west of Western Australia but had been widely transplanted into both natural and artificial water bodies and was now widespread throughout the south-west of Western Australia and had been introduced into South Australia and Victoria. Austin & Ryan (2002, p. 365) gave the distribution of *C. tenuimanus* as 'restricted to the Margaret River in the south-west of Australia'. Based on the assumption that one of the specimens in the Western Australian Museum (WAM C 127 (WAM 4131), coll. by B. Lipfert, 2.03.1911) was the holotype of *C. tenuimanus*, Austin & Ryan (2002) applied the name *C. tenuimanus* only to geographically-isolated marron found in the upper reaches of a single small catchment in the south-west of Western Australia. According to the revision of Austin & Ryan (2002), the new name *C. cainii* Austin in Austin & Ryan, 2002 would apply to all other marron in Australia and internationally, including Chile, China, South Africa, and U.S.A. Almost all historical usage of the name *Cherax tenuimanus* Smith is based on marron originating from outside the area of Smith's collection (Margaret River) and ascribed by Austin & Ryan to the species *C. cainii* Austin. Thus, a great majority of published works applying the name *C. tenuimanus* Smith, 1912 are based on animals currently referred to *C. cainii* Austin in Austin & Ryan, 2002. This is creating considerable confusion in the literature for it is unclear if papers listing *C. tenuimanus* are in fact referring to crayfish named by Austin as *C. cainii* with a world-wide distribution or to those from a relict population. In order to conserve the long-established usage of *C. tenuimanus* we propose that the Commission should reverse Austin & Ryan's use of the names *C. tenuimanus* and *C. cainii* by designating neotypes to maintain prevailing usage of the name *C. tenuimanus*.

4. Smith (1912) did not designate any specimen as a holotype for *C. tenuimanus*. We can find no record in the Natural History Museum, London (NHM) or the Western Australian Museum (WAM) referring to any holotype by Smith. Riek (1967, p. 113) refers to the 'type' of *C. tenuimanus* in NHM, and gives the type locality as Margaret River. The label with the specimen in NHM that Riek (1967) refers to states that Riek reclassified the specimen from *C. quinquecarinatus* (Gray, 1845) to *C. tenuimanus*, whereas the collection register says that this specimen was registered in 1907 and was presented by W.E. Balston. This specimen shows characters different from those in the specimen illustrated by Smith (1912). Austin & Ryan (2002, p. 363)

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erroneously identified the holotype of *C. tenuimanus* as specimen WAM C 127 (= WAM 4131) from Margaret River. The label attached to this specimen includes the comment 'type (suspected)?' by author unknown. However, while it would seem a possibility that this specimen may be part of the type series of Smith 1912, this mere citation on the label is not necessarily evidence that this specimen is the holotype.

5. Austin (2002, p. 360) designated specimen WAM C 28348 as the holotype of his new species *C. cainii*. By this action the widespread and commercially important species of crayfish that was previously universally known as *C. tenuimanus* received a new name, *C. cainii*, which would apply to many marron populations in Chile, China, South Africa, Western Australia, and U.S.A. This is causing considerable confusion.

6. In order to maintain stability in the nomenclature of this highly important crayfish the Commission is asked to set aside all previous type fixations for both species and to designate a specimen of the broadly distributed species as the neotype of *C. tenuimanus*, and a specimen of the species with limited distribution as the neotype of *C. cainii*. The selected neotypes come from the same localities as the original material and genetic testing of the neotypes has confirmed the accustomed usage of the name *C. tenuimanus*.

7. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary power to set aside all previous type fixations for the following nominal species:
  - (a) *Cherax tenuimanus* Smith, 1912, and to designate specimen labelled WAM C 37199 in the Western Australian Museum collection as the neotype;
  - (b) *Cherax cainii* Austin in Austin & Ryan, 2002, and to designate specimen labelled WAM C 37197 in the Western Australian Museum collection as the neotype;
- (2) to place on the Official List of Specific Names in Zoology the following names:
  - (a) *tenuimanus* Smith, 1912, as published in the binomen *Cherax tenuimanus* and as defined by the neotype designated in (1)(a) above;
  - (b) *cainii* Austin in Austin & Ryan, 2002, as published in the binomen *Cherax cainii* and as defined by the neotype designated in (1)(b) above.

### Acknowledgements

We would like to thank the curatorial staff of the crustacean sections of both the Western Australian Museum (Diana Jones and Melissa Hewitt) and the Natural History Museum, London (Paul Clark and Miranda Lowe), for their efforts in reviewing their respective collections of Western Australian *Cherax*.

### References

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- Austin, C.M. & Knott, B. 1996. Systematics of the freshwater crayfish genus *Cherax* Erichson (Decapoda: Parastacidae) in south-western Australia: electrophoretic, morphological and habitat variation. *Australian Journal of Zoology*, **44**: 223–258.
- Austin, C.M. & Ryan, S.G. 2002. Allozyme evidence for a new species of freshwater crayfish of the genus *Cherax* Erichson (Decapoda: Parastacidae) from the south-west of Western Australia. *Invertebrate Systematics*, **16**: 357–367.
- Avenant-Oldewage, A. 1993. Occurrence of *Temnocephala chaeropsis* on *Cherax tenuimanus* imported into South Africa, and notes on its infestation of an indigenous crab. *South African Journal of Science*, **89**: 427–428.
- Clark, E. 1936. The freshwater crayfishes of Australia. *Memoirs of the National Museum of Victoria*, **10**: 5–58.
- Henttonen, P. & Huner, J.V. 1999. The introduction of alien species of crayfish in Europe: A historical introduction. Pp. 13–22 in Gherardi, F. & Holdich, D.M. (Eds.), *Crustacean Issues 11: Crayfish in Europe as Alien Species*. Balkema, Rotterdam.
- Holdich, D.M. 2002. *Biology of Freshwater Crayfish*. 702 pp. Blackwell Science Limited, Oxford.
- Holdich, D.M., Rogers, W.D. & Reynolds, J.D. 1999. Native and alien crayfish in the British Isles. Pp. 221–236 in Gherardi, F. & Holdich, D.M. (Eds.), *Crustacean Issues 11: Crayfish in Europe as Alien Species*. Balkema, Rotterdam.
- Horwitz, P. 1990. *The Conservation Status of Australian Freshwater Crustacea. With A Provisional List of Threatened Species, Habitats and Potentially Threatening Processes*. Report Series No. 14. 121 pp. Australian National Parks and Wildlife Service, Canberra, Australia.
- Horwitz, P. 1995. *A Preliminary Key to the Species of Decapoda (Crustacea: Malacostraca) Found in Australian Inland Waters*. Co-operative Research Centre for Freshwater Ecology Identification Guide No. 5. Co-operative Research Centre for Freshwater Ecology, Albury, Australia.
- Huner, J. (Ed.). 1994. *Freshwater Crayfish Aquaculture in North America, Europe and Australia: Families Astacidae, Cambaridae and Parastacidae*. 312 pp. Food Products Press, Binghamton.
- Huxley, T.H. 1878. On the classification and the distribution of the crayfishes. *Proceedings of the Zoological Society of London*, **1878**: 751–788.
- Imgrund, J., Growth, D. & Wetherall, J. 1997. Genetic analysis of the freshwater crayfish *Cherax tenuimanus*. *Electrophoresis*, **18**: 1660–1665.
- Lawrence, C. & Jones, C. 2002. *Cherax*. Pp. 635–669 in Holdich, D.M. (Ed.), *Biology of Freshwater Crayfish*. 702 pp. Blackwell Science Limited, Oxford.
- Lawrence, C. & Morrissy, N.M. 2000. Genetic improvement of marron (*Cherax tenuimanus*) and yabbies (*Cherax* spp.) in Western Australia. *Aquaculture Research*, **31**: 69–83.
- McCulloch, R.M. 1914. Revision of the freshwater crayfish of southwestern Australia. *Records of the Western Australian Museum*, **1**: 228–235.
- Molony, B.W. & Bird, C. 2002. Annual report on the monitoring of the recreational marron fishery in 2000, with an analysis of long-term data and changes within this fishery. *Fisheries Research Report*, No. 137. 44 pp. Department of Fisheries, Western Australia.
- Molony, B.W., Morrissy, N.M. & Bird, C. 2002. The West-Australian Recreational Marron Fishery (*Cherax tenuimanus*, (Smith 1912)): History and Future Challenges. *Freshwater Crayfish*, **13**: 203–220.
- Morrissy, N.M. 1978. The past and present distribution of marron in Western Australia. *Fisheries Research Bulletin*, No. 22. 38 pp. Fisheries Department of Western Australia.
- Morrissy, N.M. & Caputi, N. 1981. Use of catchability equations for population estimation of marron, *Cherax tenuimanus* (Smith) (Decapoda: Parastacidae). *Australian Journal of Marine and Freshwater Research*, **32**: 213–225.
- Morrissy, N.M., Evans, L.E. & Huner, J.V. 1990. Australian freshwater crayfish: aquaculture species. *World Aquaculture*, **21**: 113–122.
- Nguyen, T.T.T., Meewan, M., Ryan, S. & Austin, C.M. 2002. Genetic diversity and translocation in the marron, *Cherax tenuimanus* (Smith): implications for management and conservation. *Fisheries Management and Ecology*, **9**: 163–173.

- Austin, C.M. & Knott, B. 1996. Systematics of the freshwater crayfish genus *Cherax* Erichson (Decapoda: Parastacidae) in south-western Australia: electrophoretic, morphological and habitat variation. *Australian Journal of Zoology*, **44**: 223–258.
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- Riek, E.F.** 1967. The freshwater crayfish of Western Australia (Decapoda: Parastacidae). *Australian Journal of Zoology*, **15**: 103–121.
- Shipway, B.** 1951. The natural history of marron and other freshwater crayfishes of south-western Australia. *West Australian Naturalist*, **3**: 27–34.
- Shireman, J.V.** 1973. Experimental introduction of the Australian crayfish (*Cherax tenuimanus*) into Louisiana. *Progressive Fish Culturalist*, **35**: 107–109.
- Smith, G.W.** 1912. The freshwater crayfish of Western Australia. *Proceedings of the Zoological Society of London*, **1912**: 144–170.
- Zeidler, W.** 2000. Note on the origin of freshwater crayfish occurring on Kangaroo Island, South Australia. *Records of the South Australian Museum (Adelaide)*, **33**: 1–75.

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- Riek, E.F.** 1967. The freshwater crayfish of Western Australia (Decapoda: Parastacidae). *Australian Journal of Zoology*, **15**: 103–121.
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- Smith, G.W.** 1912. The freshwater crayfish of Western Australia. *Proceedings of the Zoological Society of London*, **1912**: 144–170.
- Zeidler, W.** 2000. Note on the origin of freshwater crayfish occurring on Kangaroo Island, South Australia. *Records of the South Australian Museum (Adelaide)*, **33**: 1–75.

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Comments on this case are invited for publication (subject to editing) in the *Bulletin*; they should be sent to the Executive Secretary, I.C.Z.N., Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: [iczn@nhm.ac.uk](mailto:iczn@nhm.ac.uk)).